

# GETTING STARTED

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# CHAPTER 1

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## Introduction

### The Purpose of this Manual

This manual will describe the option modules that are available for the DL05 and DL06 micro PLC families. It will show you how to select and install an option module for your PLC.

### Supplemental Manuals

You will either need a copy of the **DL05 User Manual** (D0–USER–M) or the **DL06 User Manual** (D0–06USER–M) at hand when incorporating any one of the option modules in your PLC.

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## Conventions Used




When you see the “notepad” icon in the left-hand margin, the paragraph to its immediate right will be a **special note**. The word **NOTE**: in boldface will mark the beginning of the text.



When you see the “exclamation mark” icon in the left-hand margin, the paragraph to its immediate right will be a **warning**. This information could prevent injury, loss of property, or even death (in extreme cases). The word **WARNING**: in boldface will mark the beginning of the text.

### Key Topics for Each Chapter

The beginning of each chapter will list the key topics that can be found in that chapter.

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# Selecting the Proper Module

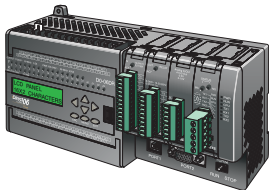
## DL05

The DL05 Micro PLC only has one option slot to install an option module. The proper selection of a module is dependent on the control application.



## DL06

The DL06 Micro PLC has four option slots. The option modules can also be added according to the control application.



## Module Choices

There are over thirty option modules available. The specifications and wiring diagrams for the discrete I/O modules can be found in the next chapter. A full description of the analog modules, D0-01MC, can be found in the DL05 Micro PLC User Manual. The communications and specialty modules are described in their respective user manuals, see user manual p/n reference below. The following table lists the modules available.

Discrete Modules	
Part Number	Description
F0-08SIM	8 point Simulator Input
D0-10ND3	10 point DC Input
D0-10ND3F	10 point fast DC Input
D0-16ND3	16 point DC Input
F0-08NA-1	8 point AC Input
D0-10TD1	10 point DC Output (sinking)
D0-16TD1	16 point DC Output (sinking)
D0-10TD2	10 point DC Output (sourcing)
D0-16TD2	16 point DC Output (sourcing)
D0-07CDR	4 point DC Input, 3 point Relay Output
D0-08TR	8 point Relay Output
D0-08CDD1	4 point DC Input, 4 point DC Output (sinking)
F0-04TRS	4 point High Current Relay Output

Analog and Specialty module choices can be found on the next page.

## Module Choices, continued.

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Analog Modules	
Part Number	Description
F0-04AD-1	4-Channel Analog Input, Current
F0-04AD-2	4-Channel Analog Input, Voltage
F0-08ADH-1	8-Channel High-Resolution Analog Input, Current
F0-08ADH-2	8-Channel High-Resolution Analog Input, Voltage
F0-04DAH-1	4-Channel High-Resolution Analog Output, Current
F0-04DAH-2	4-Channel High-Resolution Analog Output, Voltage
F0-08DAH-1	8-Channel High-Resolution Analog Output, Current
F0-08DAH-2	8-Channel High-Resolution Analog Output, Voltage
F0-2AD2DA-2	2-Channel Input/2-Channel Output Analog Combination, Voltage
F0-4AD2DA-1	4-Channel Input/2-Channel Output Analog Combination, Current
F0-4AD2DA-2	4-Channel Input/2-Channel Output Analog Combination, Voltage
F0-04RTD	4-Channel RTD Input
F0-04THM	4-Channel Thermocouple Input

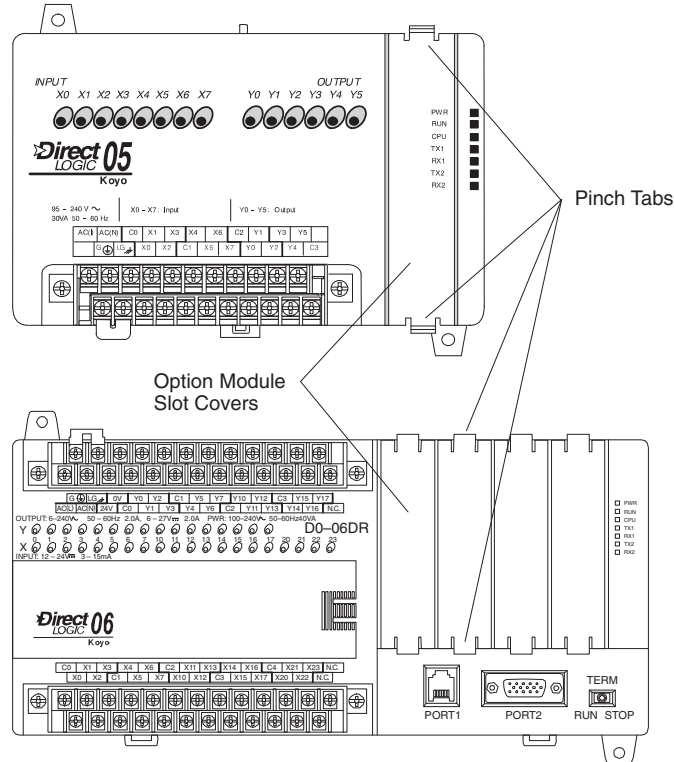
Specialty Modules	
Part Number	Description
D0-01MC	Memory Cartridge/Real Time Clock (DL05 only) (see User Manual p/n D0-USER-M)
D0-DCM	Data Communications Module
D0-DEVNETS	DeviceNet Slave (User Manual p/n D0-DEVNETS-M)
H0-ECOM(100)	10Base-T (10/100Base-T) Ethernet Network (User Manual p/n HX-ECOM-M)
H0-PSCM	Profibus Slave Communications (User Manual p/n HX-PSCM-M)
H0-CTRIO	High Speed Counter Interface (User Manual p/n HX-CTRIO-M)
F0-CP128	Triple Port Basic CoProcessor (User Manual p/n F0-CP-M)

## Installing the Option Modules

Before installing the option module in the DL05 option slot or the DL06 option slots set the necessary jumpers and/or dip switches on the module. Refer to the chapter(s) that pertains to the module(s) being installed.

### Remove the Slot Cover

The first step in installing the option module is to remove the protective option slot cover. Remove the cover by squeezing the pinch tabs and lifting the cover off.



### Insert the Module

Now, insert the module into the open slot. Locate the module so the printed information is oriented in the same direction as the markings on the PLC. Be careful to align the female connector on the printed circuit board of the module with the male connector on the PLC mother board. Press the module into the slot until the front of the module is flush with the front of the PLC. Install the remaining modules in the DL06. Once the modules are in place the PLC is ready to be programmed.



**WARNING:** Power to the PLCs must be disconnected before inserting or removing a module. Failure to disconnect power could result in serious damage to a module, the PLC or both.

## Module LED Indicator

Most discrete I/O Option modules have an LED indicator. The indicator flickers or stays constant while the CPU is accessing the module, whether in program mode or run mode. It is not a diagnostics indicator, therefore the on status is not an indication the I/O module is functioning properly.

## Power Budgeting

The DL06 has four option card slots. To determine whether the combination of cards you select will have sufficient power, you will need to perform a power budget calculation.

### Power supplied

Power is supplied from two sources, the internal base unit power supply and, if required, an external supply (customer furnished). The D0-06xx (AC powered) PLCs supply a limited amount of 24VDC power. The 24VDC output can be used to power external devices. For power budgeting, start by considering the power supplied by the base unit. All DL06 PLCs supply the same amount of 5VDC power. Only the AC units offer 24VDC auxiliary power. Be aware of the trade-off between 5VDC power and 24VDC power. The amount of 5VDC power available depends on the amount of 24VDC power being used, and the amount of 24VDC power available depends on the amount of 5VDC power consumed. Determine the amount of internally supplied power from the table on the following page.

### Power required by base unit

Because of the different I/O configurations available in the DL06 family, the power consumed by the base unit itself varies from model to model. Subtract the amount of power required by the base unit from the amount of power supplied by the base unit. Be sure to subtract 5VDC and 24VDC amounts.

### Power required by option cards

Next, subtract the amount of power required by the option cards you are planning to use. Again, remember to subtract both 5VDC and 24VDC. If your power budget analysis shows surplus power available, you should have a workable configuration.

DL06 Power Supplied by Base Units		
Part Number	5 VDC (mA)	24 VDC (mA)
D0-06xx	<1500mA	300mA
D0-06xx-D	<2000mA	200mA
	1500mA	none

DL05/06 Power Consumed by Option Cards		
Part Number	5 VDC (mA)	24 VDC (mA)
D0-07CDR	130mA	none
D0-08CDD1	100mA	none
D0-08TR	280mA	none
D0-10ND3	35mA	none
D0-10ND3F	35mA	none
D0-10TD1	150mA	none
D0-10TD2	150mA	none
D0-16ND3	35mA	none
D0-16TD1	200mA	none
D0-16TD2	200mA	none
F0-04TRS	250mA	none
F0-08NA-1	5mA	none
F0-04AD-1	50mA	none
F0-04AD-2	75mA	none
F0-2AD2DA-2	50mA	30mA
F0-4AD2DA-1	100mA	40mA
F0-4AD2DA-2	100mA	none
F0-04RTD	70mA	none
F0-04THM	30mA	none
F0-08SIM	1mA	none
F0-08ADH-1	25mA	25mA
F0-08ADH-2	25mA	25mA
F0-04DAH-1	25mA	150mA
F0-08DAH-1	25mA	220mA
F0-04DAH-2	25mA	25mA
F0-08DAH-2	25mA	25mA
D0-01MC	used only in DL05	
D0-DCM	250mA	none
D0-DEVNETS	45mA	none
H0-PSCM	530mA	none
H0-ECOM	250mA	none
H0-ECOM100	300mA	none
H0-CTRIO	250mA	none
F0-CP128	150mA	none

DL06 Base Unit Power Required		
Part Number	5 VDC (mA)	24 VDC (mA)
D0-06AA	800mA	none
D0-06AR	900mA	none
D0-06DA	800mA	none
D0-06DD1	600mA	280mA*
D0-06DD2	600mA	none
D0-06DR	950mA	none
D0-06DD1-D	600mA	280mA*
D0-06DD2-D	600mA	none
D0-06DR-D	950mA	none

\* Auxiliary 24VDC used to power V+ terminal of D0-06DD1-D sinking outputs.

DL05/DL06 Power Consumed by Other Devices		
Part Number	5 VDC (mA)	24 VDC (mA)
D0-06LCD	50mA	none
D2-HPP	200mA	none
DV1000	150mA	none
EA1-S3ML	210mA	none

Power Budgeting Example			
Power Source		5VDC power (mA)	24VDC power (mA)
D0-06DD1 (select row A or row B)	A	1500mA	300mA
	B	2000mA	200mA
Current Required		5VDC power (mA)	24VDC power (mA)
D0-06DD1		600mA	280mA*
D0-16ND3		35mA	0
D0-10TD1		150mA	0
D0-08TR		280mA	0
F0-4AD2DA-2		100mA	0
D0-06LCD		50mA	0
Total Used		1215mA	280mA
Remaining	A	285mA	20mA
	B	785mA	note 1



**NOTE 1:** If the PLC's auxiliary 24VDC power source is used to power the sinking outputs, use power choice A, above.

